The works of Brett Nortje part nineteen [14th of January 2013]

Consciousness.

> Quote by: **http://en.wikipedia.org/wiki/List_of_unsolved_problems_in_neuroscience**
> *Consciousness: What is the neuronal basis of subjective experience, cognition, wakefulness, alertness, arousal, and attention? How is the "hard problem of consciousness" solved? What is its function?[1]*

The function of consciousness is to arouse your control of your mind and body, as opposed to when you sleep and everything gets relaxed. all muscles need rest, even the heart beats slower when you sleep.

Beals conjecture.

> Quote by: **http://en.wikipedia.org/wiki/Beal%27s_conjecture**
> *Beal's conjecture is a conjecture in number theory:*
>
> *If A^x +B^y = C^z,*
>
> *where A, B, C, x, y, and z are positive integers with x, y, z > 2, then A, B, and C have a common prime factor.*

A common prime factor is where the number can be divided into prime numbers, as if you had 20, the prime factors would be 2 2 and 5.

Let's look at this simply first? if it were 4^3[64] + 4^3[64] = 4^4[256]. there, that works. just wiggle the powers around until it works is what i did. took a while though. now, we need another example and then we need to find a pattern.

5^3[125] + 5^4[625] = 5^5[750] and this works too. now to look for patterns!

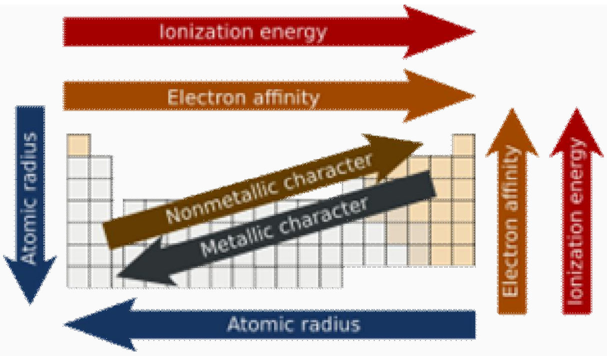
If you use common factors themselves, or, make it get to a common prime factor, you can work it out quite easily. but, when the factors are hidden, then you need a formula.

So, we could say [p+p-2=p+1] for the prime numbers, if you were to add them up as if they were actual 'factors.'

Chemical structure.

I am sure in chemistry there is a definite structure to show how many electrons each element has - as if it were a science within a science. if you were to look at a oxygen atom, maybe it has a spin equal to half that of the next atom, for example? let's start looking for patterns.

The first thing i want to know is why outer shells of electrons do not fill up before another shell forms. it must be because of the element's electric charge, 'accelerating' or maxing out the 'electric signal' so that they will go into the next shell. the exact maths behind it are a mystery to me, but i am sure that is why. i would also suggest a few families for these elements to fall into - new ones - showing how they affect the electrons. there must be a formula there too?



As we can see, the more metallic the element is the less electron affinity it has. of course, this could be because of the reaction they have to other similar elements, being that they might find electron resistance with closeness of space.

Functions.

Quote by: **http://en.wikipedia.org/wiki/Function_(mathematics)**

In mathematics, a function[1] is a relation between a set of inputs and a set of permissible outputs with the property that each input is related to exactly one output. An example is the function that relates each real number x to its square x2. The output of a function f corresponding to an input x is denoted by f(x) (read "f of x"). In this example, if the input is −3, then the output is 9, and we may write f(−3) = 9. The input variable(s) are sometimes referred to as the argument(s) of the function.

Functions are "the central objects of investigation"[2] in most fields of modern mathematics. There are many ways to describe or represent a function. Some functions may be defined by a formula or algorithm that tells how to compute the output for a given input. Others are given by a picture, called the graph of the function. In science, functions are sometimes defined by a table that gives the outputs for selected inputs. A function could be described implicitly, for example as the inverse to another function or as a solution of a differential equation.

The input and output of a function can be expressed as an ordered pair, ordered so that the first element is the input (or tuple of inputs, if the function takes more than one input), and the second is the output. In the example above, f(x) = x2, we have the ordered pair (−3, 9). If both input and output are real numbers, this ordered pair can be viewed as the Cartesian coordinates of a point on the graph of the function. But no picture can exactly define every point in an infinite set.

In modern mathematics,[3] a function is defined by its set of inputs, called the domain, a set containing the outputs, called its codomain (or range), and the set of all paired input and outputs, called its graph. For example, we could define a function using the rule f(x) = x2 by saying that the domain and codomain are the real numbers, and that the ordered pairs are all pairs of real numbers (x, x2). Collections of functions with the same domain and the same codomain are called function spaces, the properties of which are studied in such mathematical disciplines as real analysis, complex analysis, and functional analysis.

In analogy with arithmetic, it is possible to define addition, subtraction, multiplication, and division of functions, in those cases where the output is a number. Another important operation defined on functions is function composition, where the output from one function becomes the input to another function.

Quote by: **http://en.wikipedia.org/wiki/Function_(mathematics)**

Image and preimage[edit]
Main article: Image (mathematics)

If A is any subset of the domain X, then f(A) is the subset of the codomain Y consisting of all *images of elements of A. We say the f(A) is the image of A under f. The image of f is given by f(X). On the other hand, the inverse image (or preimage, complete inverse image) of a subset B of the codomain Y under a function f is the subset of the domain X defined by*

$$f^{-1}(B) = \{x \in X : f(x) \in B\}.$$

So, for example, the preimage of {4, 9} under the squaring function is the set {−3,−2,2,3}. The term range usually refers to the image,[7] but sometimes it refers to the codomain.

By definition of a function, the image of an element x of the domain is always a single element y of the codomain. Conversely, though, the preimage of a singleton set (a set with exactly one element) may in general contain any number of elements. For example, if f(x) = 7 (the constant function taking value 7), then the preimage of {5} is the empty set but the preimage of {7} is the entire domain. It is customary to write f−1(b) instead of f−1({b}), i.e.

$$f^{-1}(b) = \{x \in X : f(x) = b\}.$$

This set is sometimes called the fiber of b under f.

Use of f(A) to denote the image of a subset A ⊆ X is consistent so long as no subset of the domain is also an element of the domain. In some fields (e.g., in set theory, where ordinals are also sets of ordinals) it is convenient or even necessary to distinguish the two concepts; the customary notation is f[A] for the set { f(x): x ∈ A }. Likewise, some authors use square brackets to avoid confusion between the inverse image and the inverse function. Thus they would write f−1[B] and f−1[b] for the preimage of a set and a singleton.

So, if the equation is as it states, we can find a new quick fix by taking the answer, which we would be looking for except it is is given, and seeing where there are 'sub sums.' if you look at this directly, f to the power of minus one will divide the number or value by itself, leaving 1. then, you cube the x, or multiply it by itself twice, and then you can find b or x or whatever you are looking for.

Quote by: **http://en.wikipedia.org/wiki/Function_(mathematics)**
Inverse function[edit]
Main article: Inverse function

An inverse function for f, denoted by f−1, is a function in the opposite direction, from Y to X, satisfying

$$f \circ f^{-1} = \operatorname{id}_Y, f^{-1} \circ f = \operatorname{id}_X.$$

That is, the two possible compositions of f and f−1 need to be the respective identity maps of X and Y.
As a simple example, if f converts a temperature in degrees Celsius C to degrees Fahrenheit F, the function converting degrees Fahrenheit to degrees Celsius would be a suitable f−1.

$$\begin{align}
f(C) &= \frac {9}{5} C + 32 \\
f^{-1}(F) &= \frac {5}{9} (F - 32)
\end{align}$$

Such an inverse function exists if and only if f is bijective. In this case, f is called invertible. The notation g \circ f (or, in some texts, just gf) and f−1 are akin to multiplication and reciprocal notation. With this analogy, identity functions are like the multiplicative identity, 1, and inverse functions are like reciprocals (hence the notation).

For this inverse function, we would observe, again, that f to the power of minus 1 equals one, and, that equals some other stuff with f being 'devoured,' so, the answer is just f, as it is a two way street - completing a equation on either side of the equals sign is the answer. then, if you want to continue, you take 9 times by 5 = 45, then subtract the sum of the two you were actually supposed to divide, leaving you with 31, plus 1!

Fluid mechanics.

Quote by: **http://en.wikipedia.org/wiki/Fluid_mechanics**

Fluid mechanics is the branch of physics that studies fluids (liquids, gases, and plasmas) and the forces on them. Fluid mechanics can be divided into fluid statics, the study of fluids at rest; fluid kinematics, the study of fluids in motion; and fluid dynamics, the study of the effect of forces on fluid motion. It is a branch of continuum mechanics, a subject which models matter without using the information that it is made out of atoms, that is, it models matter from a macroscopic viewpoint rather than from a microscopic viewpoint. Fluid mechanics, especially fluid dynamics, is an active field of research with many unsolved or partly solved problems. Fluid mechanics can be mathematically complex, and can best be solved by numerical methods, typically using computers. A modern discipline, called computational fluid dynamics (CFD), is devoted to this approach to solving fluid mechanics problems. Particle image velocimetry, an experimental method for visualizing and analyzing fluid flow, also takes advantage of the highly visual nature of fluid flow.

Quote by: **http://en.wikipedia.org/wiki/Fluid_mechanics**

The general form of the Navier–Stokes equations for the conservation of momentum is:

$$\rho\frac{D\mathbf{v}}{D t} = \nabla\cdot\mathbb{P} + \rho\mathbf{f}$$

where

$\rho\ $ *is the fluid density,*

$\frac{D}{D t}$ *is the substantive derivative (also called the material derivative),*

$\mathbf{v}$ *is the velocity vector,*

$\mathbf{f}$ *is the body force vector, and*

$\mathbb{P}$ *is a tensor that represents the surface forces applied on a fluid particle (the stress tensor).*

Unless the fluid is made up of spinning degrees of freedom like vortices, $\mathbb{P}$ *is a symmetric tensor. Usually the stress tensor is decomposed as*

$$P_{ij} = -p \delta_{ij} + \tau_{ij}$$

where $-p \delta_{ij}$ *is a static isotropic stress state (that would exist if the fluid were at rest), and* τ_{ij} *is the desviatoric stress tensor, corresponding to the part of the stress due to the fluid motion. Generally, the scalar p can be taken as the thermodynamic pressure, whereas* τ_{ij} *is called the viscous stress tensor. Furthermore, the diagonal components of tensor* $\mathbf{\tau}$ *are called normal stresses and the off-diagonal components are called shear stresses.*

The vectorial Navier–Stokes equation above can be written then as

$$\rho\frac{D\mathbf{v}}{D t} = -\nabla p + \nabla\cdot\mathbf{\tau} + \rho\mathbf{f}$$

This can be found as r plus f. you just ignore all the other things that say plus p and minus p, and two upside down triangles that are also plus and minus, equaling 0.

> Quote by: **http://en.wikipedia.org/wiki/Fluid_mechanics**
> *Equations for a Newtonian fluid[edit]*
>
> *Main article: Newtonian fluid*
>
> *The constant of proportionality between the viscous stress tensor and the velocity gradient is known as the viscosity. A simple equation to describe incompressible Newtonian fluid behaviour is*
>
> *\tau=-\mu\frac{dv}{dy}*
>
> *where*
>
> *\tau is the shear stress exerted by the fluid ("drag")*
>
> *\mu is the fluid viscosity – a constant of proportionality*
>
> *\frac{dv}{dy} is the velocity gradient perpendicular to the direction of shear.*
>
> *For a Newtonian fluid, the viscosity, by definition, depends only on temperature and pressure, not on the forces acting upon it. If the fluid is incompressible the equation governing the viscous stress (in Cartesian coordinates) is*
>
> *\tau_{ij}=\mu\left(\frac{\partial v_i}{\partial x_j}+\frac{\partial v_j}{\partial x_i} \right)*
> *where*
>
> *\tau_{ij} is the shear stress on the i^{th} face of a fluid element in the j^{th} direction*
>
> *v_i is the velocity in the i^{th} direction*
>
> *x_j is the j^{th} direction coordinate.*
>
> *If the fluid is not incompressible the general form for the viscous stress in a Newtonian fluid is*
>
> *\tau_{ij} = \mu \left(\frac{\partial v_i}{\partial x_j} + \frac{\partial v_j}{\partial x_i} - \frac{2}{3} \delta_{ij} \nabla \cdot*
> *\mathbf{v} \right) + \kappa \delta_{ij} \nabla \cdot \mathbf{v}*
>
> *where \kappa is the second viscosity coefficient (or bulk viscosity). If a fluid does not obey this relation, it is termed a non-Newtonian fluid, of which there are several types. Non-Newtonian fluids can be either plastic, Bingham plastic, pseudoplastic, dilatant, thixotropic, rheopectic, viscoelatic.*

This is a little harder than navier stokes, or, the first 'sum.'

I propose not to work this out conventionally, as it is very difficult to do. instead, let's work out the sheer stress on the fluid? the stress on the fluid is equal to the mass divided by the area equaling density.

Mathematical modeling.

> Quote by: **http://en.wikipedia.org/wiki/Mathematical_model**

A mathematical model is a description of a system using mathematical concepts and language. The process of developing a mathematical model is termed mathematical modelling. Mathematical models are used not only in the natural sciences (such as physics, biology, earth science, meteorology) and engineering disciplines (e.g. computer science, artificial intelligence), but also in the social sciences (such as economics, psychology, sociology and political science); physicists, engineers, statisticians, operations research analysts and economists use mathematical models most extensively. A model may help to explain a system and to study the effects of different components, and to make predictions about behaviour.

Mathematical models can take many forms, including but not limited to dynamical systems, statistical models, differential equations, or game theoretic models. These and other types of models can overlap, with a given model involving a variety of abstract structures. In general, mathematical models may include logical models, as far as logic is taken as a part of mathematics. In many cases, the quality of a scientific field depends on how well the mathematical models developed on the theoretical side agree with results of repeatable experiments. Lack of agreement between theoretical mathematical models and experimental measurements often leads to important advances as better theories are developed.

Quote by: **http://en.wikipedia.org/wiki/Mathematical_model**
Model of a particle in a potential-field. In this model we consider a particle as being a point of mass which describes a trajectory in space which is modeled by a function giving its coordinates in space as a function of time. The potential field is given by a function V\!:\mathbb{R}^3\!\rightarrow\mathbb{R} and the trajectory, that is a function \mathbf{r}\!:\mathbb{R}\rightarrow\mathbb{R}^3, is the solution of the differential equation:

-\frac{\mathrm{d}^2\mathbf{r}(t)}{\mathrm{d}t^2}m=\frac{\partial V[\mathbf{r}(t)]}{\partial x}\mathbf{\hat{x}}+\frac{\partial V[\mathbf{r}(t)]}{\partial y}\mathbf{\hat{y}}+\frac{\partial V[\mathbf{r}(t)]}{\partial z}\mathbf{\hat{z}},

that can be written also as:

m\frac{\mathrm{d}^2\mathbf{r}(t)}{\mathrm{d}t^2}=-\nabla V[\mathbf{r}(t)].
Note this model assumes the particle is a point mass, which is certainly known to be false in many cases in which we use this model; for example, as a model of planetary motion.

The solution to this would be m + d + r + t = V, as the powers and multiplication in the top is echoed in the dividing factors at the bottom.
